

WHAT IS CLAIMED IS:

1. A fuel-fired, forced draft heating appliance comprising:

a chamber having an exterior wall with an air intake opening therein;

5 a heat exchanger;

a fuel burner operative to create hot combustion products in said heat exchanger;

a draft inducer fan disposed in said chamber, having a motor, and being operative to expel flue gas from said heat exchanger and to create
10 with said chamber a negative pressure that draws a first quantity of combustion air into said chamber, for delivery to said fuel burner, sequentially through said air intake opening, through the interior of said chamber via a substantially unenclosed flow path therein, and against said motor in a manner cooling said motor prior to delivery of said first
15 quantity of combustion air to said fuel burner; and

a deflector structure supported within said chamber in an inwardly spaced apart, facing relationship with said air intake opening, said deflector structure being operative to be impinged by said first quantity of combustion air and redirect it generally toward said motor through
20 said substantially unenclosed flow path within said chamber.

2. The heating appliance of Claim 1 wherein:

said draft inducer fan is further operative to draw a second quantity of combustion air inwardly through said air intake opening for delivery to
25 said fuel burner through the interior of said chamber via a substantially unenclosed flow path therein which bypasses said motor.

3. The heating appliance of Claim 2 wherein:

said deflector structure is further operative to be impinged by and change the flow direction of said second quantity of combustion air.

5 4. The heating appliance of Claim 1 wherein:

said deflector structure is a generally flat deflector plate member.

5. The heating appliance of Claim 4 wherein:

said deflector plate member is operatively supported and positioned
10 within said chamber by a support member secured to said exterior wall of said chamber.

6. The heating appliance of Claim 5 wherein:

said support member is a generally flat member which is angled with
15 respect to said deflector plate member.

7. The heating appliance of Claim 6 wherein:

said support plate member is formed integrally with said deflector plate member.

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8. The heating appliance of Claim 1 wherein:

said heating appliance is an air heating furnace.

9. The heating appliance of Claim 8 wherein:

25 said air heating furnace is a gas-fired air heating furnace.

10. The heating appliance of Claim 1 wherein:

said fuel burner is an inshot-type fuel burner.

11. The heating appliance of Claim 1 wherein:
said draft inducer fan includes a fan housing,
said motor has an apertured housing portion, is disposed externally
of said fan housing, and rotationally drives a shaft, and
5 said draft inducer fan further includes a fan blade structure drivably
mounted on said shaft externally of said fan housing and being operative
to draw combustion air through the interior of said motor housing.

12. The heating appliance of Claim 1 further comprising:
10 a baffle structure positioned adjacent said fuel burner and being
operative to shield said fuel burner from flicker-creating impingement by
combustion air delivered to said fuel burner through said chamber.

13. The heating appliance of Claim 12 wherein:
15 said fuel burner is carried by a frame, and
said baffle structure includes a baffle plate member mounted on
said frame.

14. The heating appliance of Claim 13 wherein:
20 said fuel burner is positioned beneath said draft inducer fan within
said chamber, and
said baffle plate member is mounted on a top side portion of said
frame above said fuel burner.

15. The heating appliance of Claim 1 wherein:

said motor has a motor housing portion with a plurality of cooling openings therein, and

a portion of said first quantity of combustion flows through the
5 interior of said motor housing portion, via said cooling openings therein,
during operation of said draft inducer fan.

16. A method of operating a fuel-fired, forced draft heating appliance including a chamber having an exterior wall with an air intake openings therein, a heat exchanger, a fuel burner operatively associated with said heat exchanger, and a draft inducer fan disposed in said chamber, having a motor, and being operative to expel flue gas from said heat exchanger, said method comprising the steps of:

supporting a deflector structure within said chamber in an inwardly spaced apart, facing relationship with said air intake opening; and

cooling said motor by sequentially flowing combustion air inwardly through said air intake opening, causing the combustion air entering said chamber through said air intake opening to impinge upon and be deflected in a changed flow direction by said deflector structure, flowing the deflected combustion air into contact with said motor via a substantially unenclosed flow path within said chamber, and then delivering said combustion air to said fuel burner.

17. The method of Claim 16 wherein:

said cooling step is performed by utilizing said draft inducer fan to create a negative pressure within said chamber.

18. The method of Claim 16 wherein said motor has a housing portion with cooling openings therein and is drivingly coupled to a shaft, and said cooling step includes the steps of:

connecting a fan blade structure to said shaft for driven rotation thereby, and

using the rotationally driven fan blade structure to flow combustion air through the interior of said housing portion via said cooling openings therein.

19. The method of Claim 16 wherein:

said fuel burner, during operation thereof, generates a flame exposed to said chamber, and

said method further comprises the step of shielding said flame from
5 flicker-creating impingement thereon by combustion air delivered to said fuel burner.

20. The method of Claim 19 wherein:

said shielding step includes the step of interposing a baffle member
10 between said fuel burner and said draft inducer fan.

21. The method of Claim 16 wherein said combustion air is a first quantity of combustion air, and said cooling step further includes the step of:

15 flowing a second quantity of combustion air inwardly through said intake opening to said fuel burner via a substantially unenclosed flow path disposed within said chamber and bypassing said motor.

22. The method of Claim 21 further comprising the step of:

20 causing said second quantity of combustion air to impinge on said deflector structure.